

Vadose Zone Fact Sheet Portsmouth Gaseous Diffusion Plant

Background: The Portsmouth Gaseous Diffusion Plant is located in south central Ohio, approximately 32 km (20 mi) north of Portsmouth, Ohio, and 112 km (70 mi) south of Columbus, Ohio. The site is situated on a 1,483-hectacre (3,708-acre) Federal reservation approximately 6.5 km (4 mi) south of the Village of Piketon. Currently, Portsmouth has two primary missions. The first mission continues to be the enrichment of uranium by a gaseous diffusion process. The second mission is the environmental restoration and related waste management activities of the plant.

Issues: Recent publicity at DOE gaseous diffusion plants has brought activities at Portsmouth under close public scrutiny.

Vadose zone infiltration: Infiltration from precipitation has been estimated to range between 23 and 35 cm (8.9 and 13.9 in) per year excluding the affects of buildings, paving, and drainage control. Ground water recharge may be as low as 5 to 10 cm (2 to 4 in) per year when including buildings, paving, and drainage control.

Vadose zone characterization/remediation: Numerous removal and remedial actions, and landfill cap construction have remediated or contained contaminants in place.

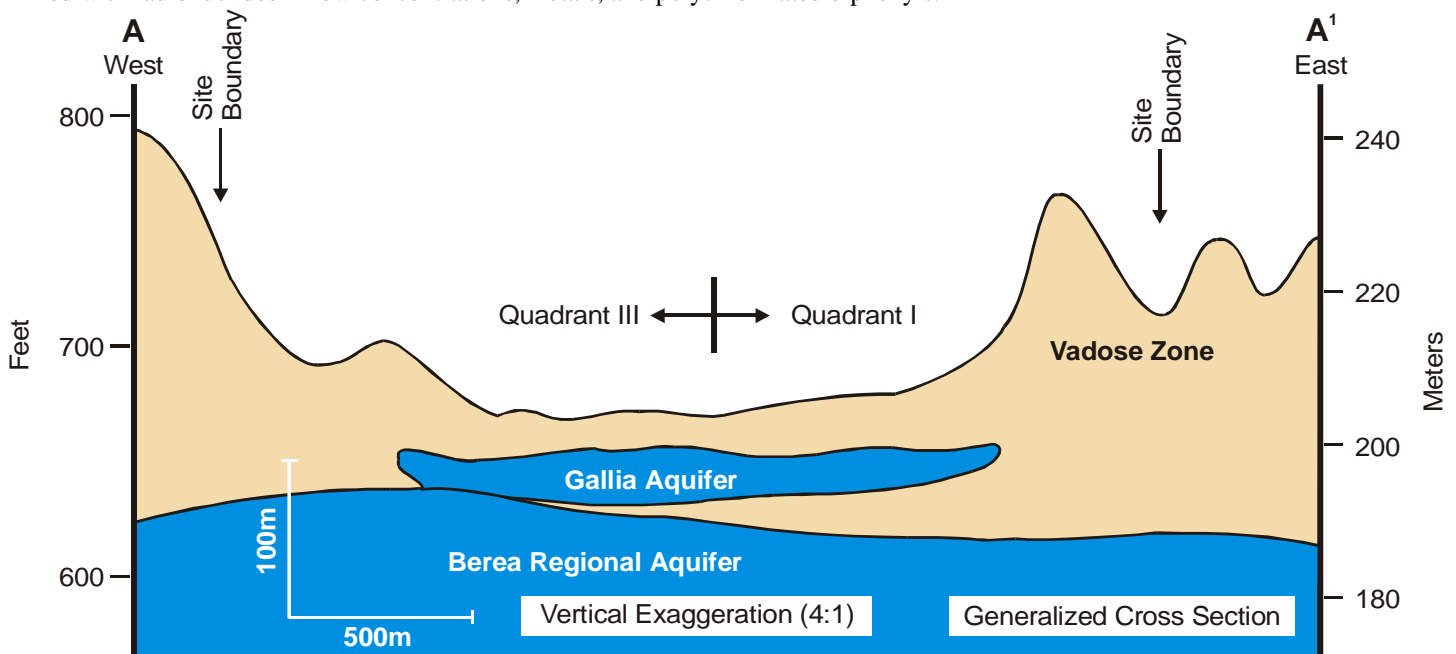
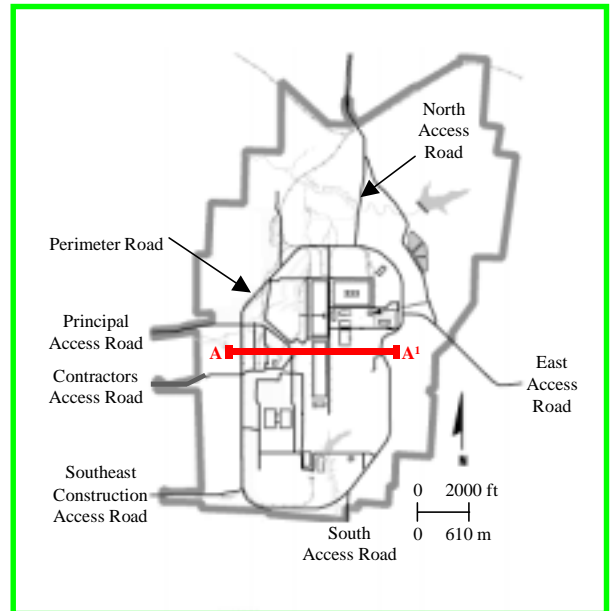
Precipitation: The total annual precipitation averages approximately 102 cm (40 in).

Surface waters: Creeks, drainage ditches, and holding ponds are the prominent surface water features at Portsmouth. All surface water eventually drains into the Scioto River, which flows south to the Ohio River. Little Beaver Creek and Big Run Creek provide drainage for a large portion of the site.

Geology: The facility is located within a mile-wide river valley ranging in elevation from 174 to 265 m (570 to 870 ft) above sea level. The near surface geologic materials consist of several bedrock sandstone and shale formations, and unconsolidated deposits of clay, silt, sand, and gravel.

Vadose zone thickness: The depth to the aquifer ranges from 3 to 4.6 m (10 to 15 ft) for most of the site.

Major contaminants of concern: The contaminants include chlorinated solvents, such as trichloroethylene, chlorinated solvents mixed with radionuclides in low concentrations, metals, and polychlorinated biphenyls.



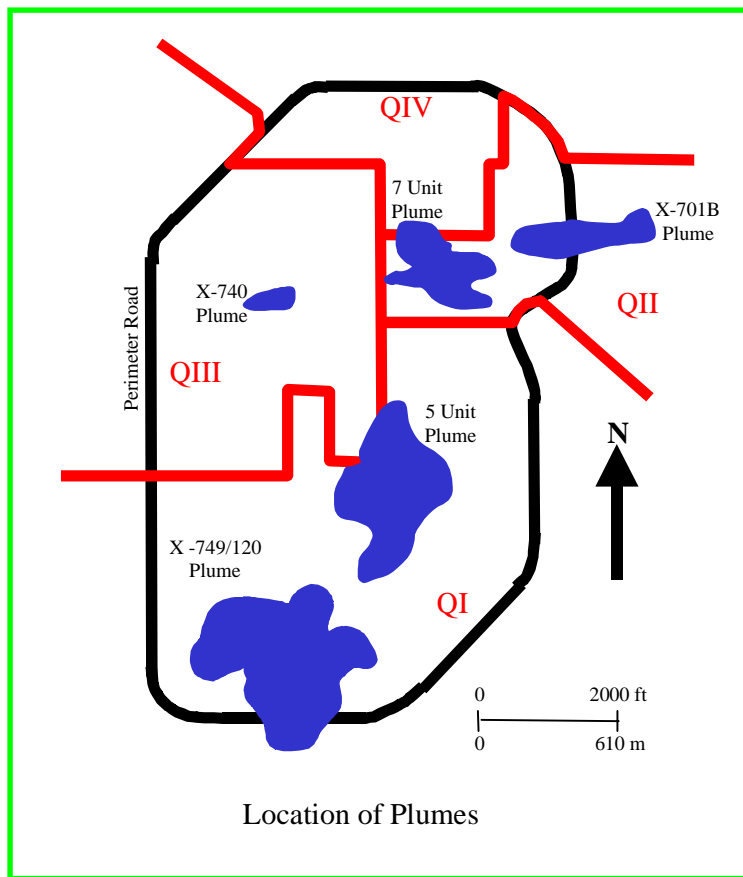
Ground Water Fact Sheet Portsmouth Gaseous Diffusion Plant

Background: The Portsmouth Gaseous Diffusion Plant is located in south central Ohio, approximately 32 km (20 mi) north of Portsmouth, Ohio, and 112 km (70 mi) south of Columbus, Ohio. The site is situated on a 1,483-hectacre (3,708-acre) Federal reservation approximately 6.5 km (4 mi) south of the Village of Piketon. Currently, Portsmouth has two primary missions. The first mission continues to be the enrichment of uranium by a gaseous diffusion process. The second mission is the environmental restoration and related waste management activities of the plant.

Hydrogeology: To facilitate the remediation and restoration process, the site was divided into four quadrants, based in large part on ground water flow. Quadrants with greater potential risk from ground water contamination were designated as higher priority and were investigated first. The ground water flow system at the facility includes two water-bearing units: the Berea in the sandstone bedrock, the primary regional aquifer, and the Gallia in the unconsolidated sediments, the uppermost and primary water bearing unit at the facility. Natural ground water recharge occurs from precipitation with ground water discharge occurring primarily along streams that transect the site. Ground water recharge and discharge are also affected by building sumps and utility systems.

Issues: There is no known contaminated ground water off-site and remedial actions should prevent off-site migration.

Ground water characterization/remediation: Initial characterization has been completed with Corrective Measure Studies recently issued for all four quadrants and a Record of Decision for one quadrant. Environmental restoration activities completed to date include: installation of monitoring and extraction wells; operation of five operating ground treatment facilities and a passive ground water treatment facility; construction of slurry walls, containment walls, barrier walls, and inceptor trenches; and implementation of phytoremediation.



Ground water use: There are no current or future anticipated uses.

Plume Designation	Primary Contaminants	Depth	Remedial Approach
5 Unit Plume	TCE	3 to 4.6 m (10 to 15 ft)	P&T; CA
X-749 Plume	TCE	3 to 4.6 m (10 to 15 ft)	Bio; phy; P&T; CA
X-740 Plume	TCE; Tc-99	3 to 4.6 m (10 to 15 ft)	phy
X-701B Plume	TCE; Tc-99	3 to 4.6 m (10 to 15 ft)	P&T; CA
7 Unit Plume	TCE; Tc-99	3 to 4.6 m (10 to 15 ft)	P&T; CA
X-120 Plume	TCE	3 to 4.6 m (10 to 15 ft)	Bio; phy

TCE = trichloroethylene; Tc = technetium; P&T = pump and treat; CA = carbon adsorption; bio = bioremediation; phy = phytoremediation